



CLASS II

SERVICE INSTRUCTIONS

76, 77

No. 1175
ATA Code 77-00

SUBJECT: ENGINE INDICATING - MODIFICATION AND CALIBRATION OF AIRCRAFT INSTRUMENT AND DEVELOPMENT INCORPORATED ENGINE INSTRUMENT CLUSTERS

NOTE

These Service Instructions supersede and cancel BEECHCRAFT Service Instructions No. 1065.

EFFECTIVITY: BEECHCRAFT Duchess 76, serials ME-1 through ME-349; Skipper 77, serials WA-1 through WA-101 and WA-104; and any other Duchess 76 and Skipper 77 airplanes which may have installed a replacement engine instrument cluster manufactured by Aircraft Instrument and Development Incorporated with any of the following serial numbers:

MODEL	ENGINE INSTRUMENT CLUSTER PART NUMBER	ENGINE INSTRUMENT CLUSTER SERIAL NUMBER
76	105-389011-5 (14 volt system) or 105-389011-31 (28 volt system)	1 through 419, 1000 through 1068 and 1088 through 1091
77	108-384003-23	1 through 279

NOTE

These Service Instructions affect only engine instrument clusters manufactured by Aircraft Instrument and Development Incorporated. Other engine instrument clusters are not affected.

REASON: To provide improved reliability of the engine instrument cluster.

COMPLIANCE: At the owner's discretion, however, Beech Aircraft Corporation recommends that this modification be accomplished and the engine instrument cluster be recalibrated the next time the engine instrument cluster is removed from the airplane for any type of maintenance.

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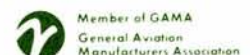
Beech Aircraft Corporation issues service information for the benefit of owners and fixed base operators in the form of three classes of Service Instructions. CLASS I (Red Border) are changes, inspections, and modifications that could affect safety. The factory considers compliance mandatory. CLASS II (Green Border) covers changes, modifications, improvements or inspections the factory feels will benefit the owner and although highly recommended, they are not considered mandatory compliance, unless specified at the time of issuance. Class I and II are mailed to:

- (a) BEECHCRAFT Aero or Aviation Centers and International Distributors and Dealers.
- (b) Owners of record on the FAA Registration list and the

BEECHCRAFT International Owner Notification Service List.
(c) Those having a publications subscription.

CLASS III (No Border) covers changes which are optional, maintenance aids, product improvement kits and miscellaneous service information. Compliance is at the owner or operator's prerogative. Copies of Class III are distributed per a and c above. Information on Owner Notification Service or Subscriptions can be obtained through any BEECHCRAFT Aero or Aviation Center, International Distributor and Dealer, or the Factory. As Service Instructions are issued, temporary notation in the index should be made until the index is revised. Warranty will be allowed only when specifically defined in the Service Instructions and in accordance with Beech Warranty Policy.

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CLASS II

Service Instructions No. 1175

APPROVAL: FAA Approved.

MANPOWER: The following information is for planning purposes only:

Estimated man-hours: 4 hours.
Suggested number of men: 1 man.

MATERIAL: The following parts required for this modification may be ordered through BEEHCRAFT Aero or Aviation Centers and International Distributors and Dealers.

PART NUMBER	DESCRIPTION	QUANTITY PER AIRPLANE
49-0037	Mylar Strip	12 (Duchess 76) 6 (Skipper 77)
*476	Black Vinyl Tape	As Required

*P/N of Minnesota Mining and Manufacturing Company, 3M Center, St. Paul, Minnesota 55101. May be obtained from local sources.

The value of the parts required to incorporate these Service Instructions on one airplane is to be advised. Prices, when issued, will be subject to change without notice.

WARRANTY: BEEHCRAFT Warranty on a new airplane is 180 days from delivery or 180 days from the date noted on the Owner Warranty Card. Warranty credit for parts and labor to the extent noted under MATERIAL and MANPOWER will be allowed on BEEHCRAFTS within warranty at the time these Service Instructions are released.

All warranty reimbursements are handled through franchised BEEHCRAFT Aero or Aviation Centers and International Distributors and Dealers. Owners and operators should arrange with these outlets to perform the work and have them submit the standard Beech Aircraft Corporation warranty claim form through BEEHCRAFT Parts and Equipment Marketing Wholesalers or International Distributors.

SPECIAL TOOLS: None.

WEIGHT AND BALANCE: None.

REFERENCES: BEEHCRAFT Duchess 76 Maintenance Manual, P/N 105-590000-7 or subsequent, Chapter 77-00; BEEHCRAFT Skipper 77 Maintenance Manual, P/N 108-590000-7 or subsequent, Chapter 77-00; BEEHCRAFT Duchess 76 Wiring Diagram Manual (14 Volt), P/N 105-590000-15B or subsequent, Chapter 77-20; BEEHCRAFT Duchess 76 Wiring Diagram Manual (28 Volt), P/N 105-590000-21 or subsequent, Chapter 77-20; BEEHCRAFT Skipper 77 Wiring Diagram Manual, P/N 108-590000-15B or subsequent, Chapter 91-15.

PUBLICATIONS AFFECTED: It is recommended that a note to "See Service Instructions No. 1175" be made in the following:

BEEHCRAFT Duchess 76 Maintenance Manual, P/N 105-590000-7 or subsequent, Chapter 77-00; BEEHCRAFT Skipper 77 Maintenance Manual, P/N 108-590000-7 or subsequent, Chapter 77-00; BEEHCRAFT Duchess 76 Parts Catalog, P/N 105-590000-9B or subsequent, Chapter 39-10; BEEHCRAFT Skipper 77 Parts Catalog, P/N 108-590000-9 or subsequent, Chapter 39-10.

ACCOMPLISHMENT These Service Instructions may be accomplished as follows:
INSTRUCTIONS:

1. Turn off and/or disconnect all electrical power and disconnect the battery.
2. Remove the instrument panel glareshield.
3. Inspect the engine instrument cluster and determine if it was manufactured by Aircraft Instrument and Development Incorporated.
4. If the engine instrument cluster was not manufactured by Aircraft Instrument and Development Incorporated, reinstall the glareshield and reconnect the battery. No further action is necessary.
5. If the engine instrument cluster was manufactured by Aircraft Instrument and Development Incorporated but does not have one of the serial numbers listed under EFFECTIVITY, reinstall the glare shield and reconnect the battery. No further action is necessary.
6. If the engine instrument cluster was manufactured by Aircraft Instrument and Development Incorporated and does have one of the serial numbers listed under EFFECTIVITY, continue with step 7.
7. Refer to the Maintenance Manual, Chapter 77-00 and remove the engine instrument cluster.

NOTE

Steps 8 through 15 must be accomplished by an appropriately rated instrument repair facility.

8. Refer to the wiring diagrams in Figures 4, 5 and 6 and repair the engine instrument cluster if required.
9. Prior to reassembling the cluster, remove any and all tape that may be found around the meter movements and on the inside of the face mask. Install P/N 49-0037 mylar strips on the front of each meter movement by securing the strips under the heads of the screws that attach the dial face to the meter movement as shown in Figure 1.

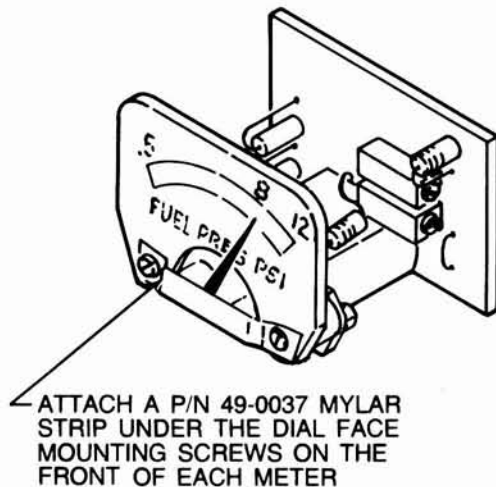


Figure 1

10. Using a magnifying glass, inspect each meter movement for dirt and debris. Pay particular attention to the area between the armature and the magnet in each meter movement. Clean the meter movements as necessary.

11. Using the resistance and voltage values specified in Table 1, calibrate the engine instrument cluster as follows:

NOTE

Before applying power to the engine instrument cluster, test resistances must be connected to the pins corresponding to each module to be tested or the unused pins should be grounded to prevent damage to the meter movements. Any pin left open may cause the corresponding meter movement to go rapidly to full scale and possibly damage the meter movement.

- a. Connect a regulated 14 volt DC (for P/N 105-389011-5 and P/N 108-384003-23) or 28 volt DC (for P/N 105-389011-31) power supply to pin 1 of engine instrument cluster electrical connector. Connect pin 2 to ground. Ground the chassis of the power supply to the instrument cluster case.

- b. For fuel quantity, fuel pressure, oil pressure, oil temperature and cylinder head temperature indicators, connect the appropriate resistance for the low scale indication as specified in Table 1 between the appropriate pin of the electrical connector (see Table 2) and ground. Adjust the zero (Z) adjustment potentiometer (see Figure 2) so the meter reads at the low scale mark on the meter dial face.

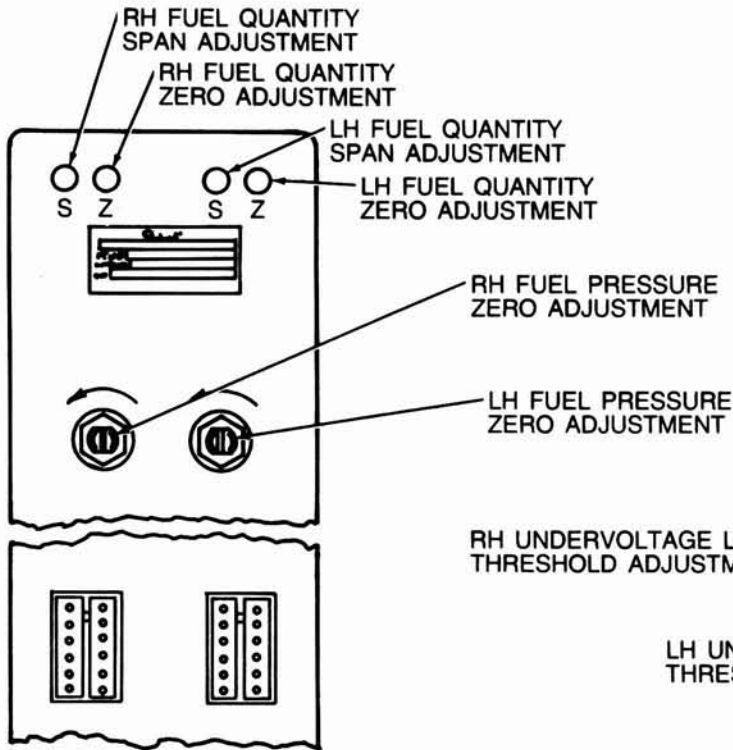
- c. Connect the appropriate resistance for the high scale indication from Table 1 in place of the resistance used in step 11b and adjust the span (S) adjustment potentiometer (see Figure 2) so the meter reads at the high scale mark on the meter dial face.

- d. Substitute resistances for the various midrange indications from Table 1 for the resistance used in step 11c and observe that the meter indicates within 1/16 inch of the appropriate mark on the meter dial face.

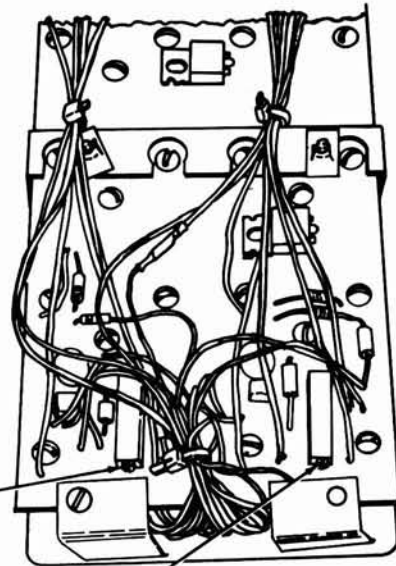
- e. On P/N 105-389011-5 and 105-389011-31 engine instrument clusters only, connect a variable power supply to pin 11 (see Table 2). Set the voltage at 14 or 28 volts, as applicable, and gradually reduce the voltage until the undervoltage light is illuminated. The light should illuminate at $12.2 \pm .1$ volts on 14 volt clusters and $23.75 \pm .5$ volts on 28 volt clusters. The undervoltage circuit potentiometer (see Figure 2) should be adjusted within these limits. Clockwise increases the voltage at which the light illuminates.

- f. On P/N 108-384003-23 engine instrument clusters only, connect a 0-50 ohm 10 turn linear potentiometer between pin 4 (see Table 2) and ground and gradually reduce the resistance. The LH fuel quantity gage should drop and the low fuel light should illuminate at 11-

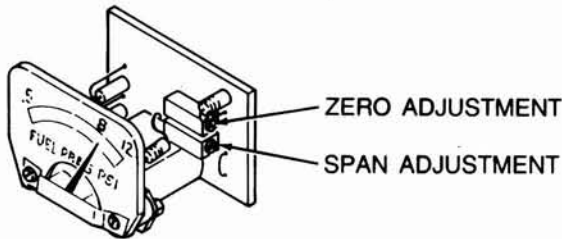
Service Instructions No. 1175



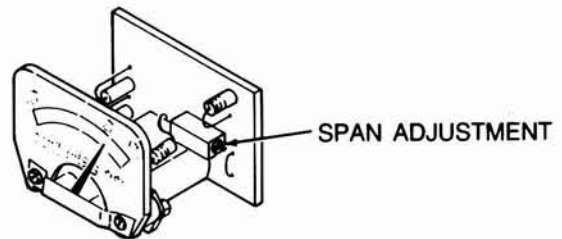
DUCHESS 76 INSTRUMENT CLUSTER ADJUSTMENT POINTS
(105-389011-5 & 105-389011-31)



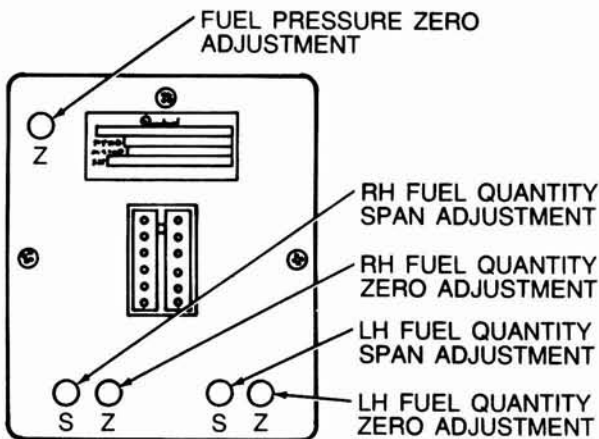
DUCHESS 76 INSTRUMENT CLUSTER UNDER VOLTAGE CIRCUIT ADJUSTMENTS
(105-389011-5 & 105-389011-31)



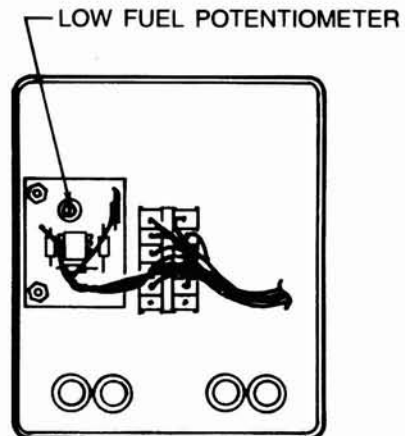
DUCHESS 76 AND SKIPPER 77 FUEL PRESSURE, OIL PRESSURE, OIL TEMPERATURE AND CYLINDER HEAD TEMPERATURE GAGES



DUCHESS 76 LOADMETER OR SKIPPER 77 AMMETER



SKIPPER 77 INSTRUMENT CLUSTER ADJUSTMENT POINTS
(108-384003-23)



SKIPPER 77 LOW FUEL LIGHT ADJUSTMENTS (108-384003-23)

Figure 2
Engine Instrument Cluster Adjustment Points

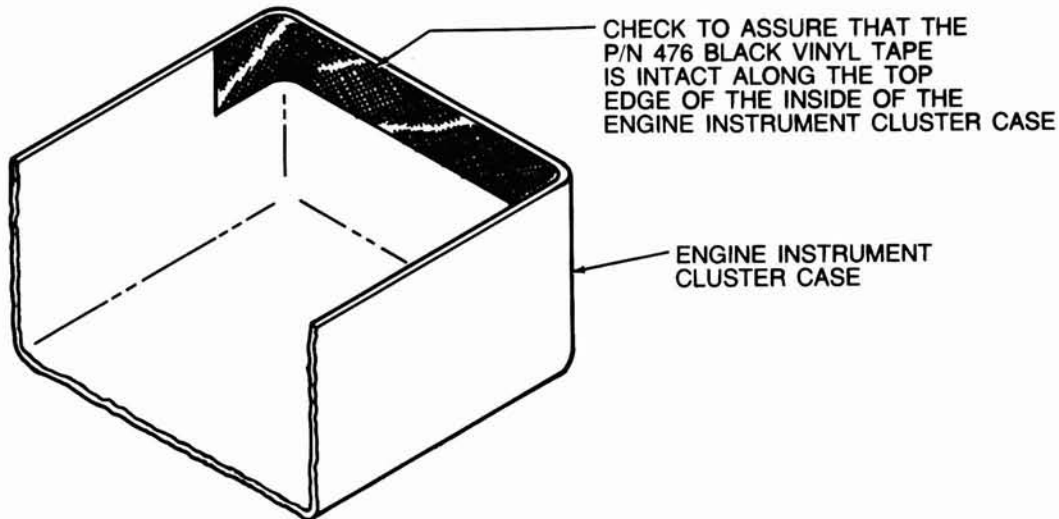


Figure 3
Duchess 76 Engine Instrument Cluster Case

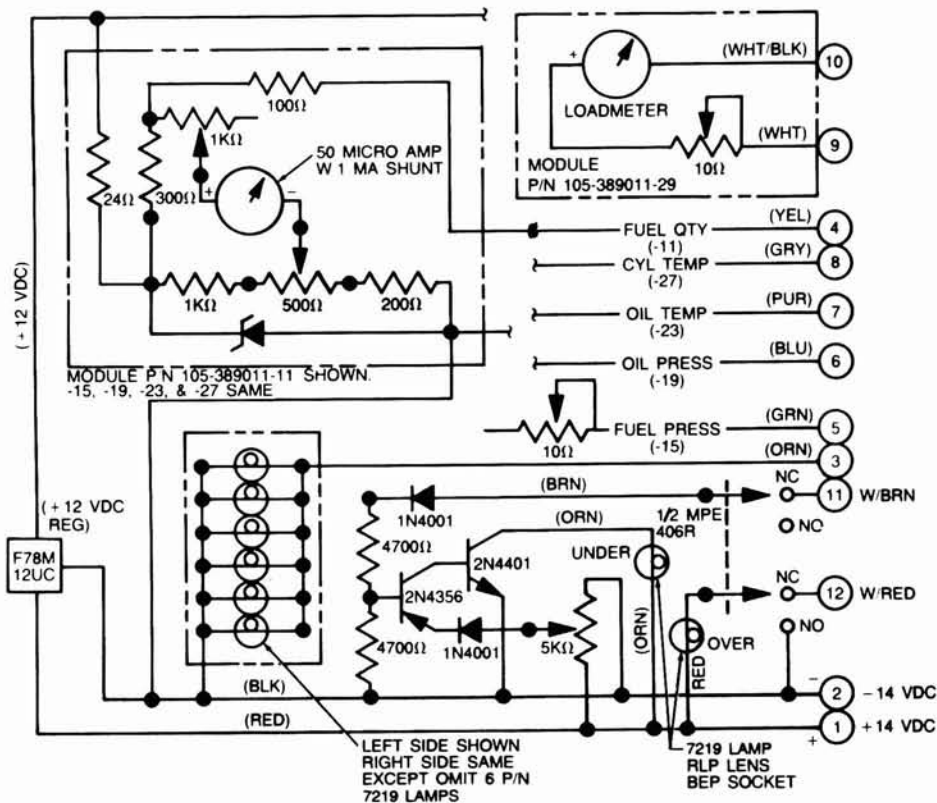


Figure 4
Duchess 76 Engine Instrument Cluster Wiring Diagram
(105-389011-5 14 Volt)

